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NOTICE OF ALLOWANCE AND FEE(S) DUE

23419	7590	09/08/2008

COOLEY GODWARD KRONISH LLP
ATTN: Patent Group
Suite 1100
777 - 6th Street, NW
Washington, DC 20001

EXAMINER
WHIPPLE, BRIAN P

ART UNIT	PAPER NUMBER
2152	

DATE MAILED: 09/08/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,491	12/11/2003	Maksim Ioffe	NVID-078/00US 10060-2153	1636

TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD TO PREVENT ADDRESS RESOLUTION CACHE SPOOFING

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1440	$0	$0	$1440	12/08/2008

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.
PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS.
THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON
PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE
MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS
STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES
NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS
PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM
WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW
DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current
SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown
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B. If the status above is to be removed, check box 5b on Part B -
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If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now
claiming SMALL ENTITY status, check box 5a on Part B - Fee(s)
Transmittal and pay the PUBLICATION FEE (if required) and 1/2
the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office
(USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b"
of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a
request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing
the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to
Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of
maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

<table>
<tr><td>23419</td><td>7590</td><td>09/08/2008</td></tr>
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Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)
_____ (Signature)
_____ (Date)

<table>
<tr><td>APPLICATION NO.</td><td>FILING DATE</td><td>FIRST NAMED INVENTOR</td><td>ATTORNEY DOCKET NO.</td><td>CONFIRMATION NO.</td></tr>
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TITLE OF INVENTION: APPARATUS, SYSTEM, AND METHOD TO PREVENT ADDRESS RESOLUTION CACHE SPOOFING

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<tr><td colspan="2">EXAMINER</td><td>ART UNIT</td><td>CLASS-SUBCLASS</td></tr>
<tr><td colspan="2">WHIPPLE, BRIAN P</td><td>2152</td><td>709-245000</td></tr>
</table>

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.
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PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.   OMB 0651-0033   U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,491	12/11/2003	Maksim Ioffe	NVID-078/00US	1636
			140060-2153	

EXAMINER
WHIPPLE, BRIAN P

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23419   7590   09/08/2008

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Suite 1100
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Washington, DC 20001

DATE MAILED: 09/08/2008

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 892 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 892 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

	Application No.	**Applicant(s)**
Notice of Allowability	10/734,491	IOFFE ET AL.
	Examiner	**Art Unit**	
	Brian P. Whipple	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed on 6/5/08*.

2. ☒ The allowed claim(s) is/are *1-4,9-14,16,18,21 and 23*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

      a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

          1. ☐ Certified copies of the priority documents have been received.

          2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

          3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☒ Examiner's Amendment/Comment

8. ☐ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

<center>**EXAMINER'S AMENDMENT**</center>

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for an examiner's amendment was given in a telephone interview with Edward Van Gieson on 8/20/08.

However, the Examiner has made several minor changes to the draft claims submitted by Edward Van Gieson (by way of facsimile on 8/21/08). Such as to amend numerous instances of the word "the" to "said" in the claims in order to remain consistent with terminology throughout the claims (as "the" is used generically several times and it would create confusion to use "the" both in the generic sense and as an alternative to "said").

Additionally, claim 10 has been amended to read as a firewall "stored on a machine readable medium" as opposed to Edward Van Gieson's suggestion to remove "resident on a host computer" without replacing it with a similar phrase. Removing the phrase with no further modification would create a 35 U.S.C. 101 rejection as the firewall alone may be implemented in at least one embodiment as software (see [0029] of Applicant's specification which discusses the firewall being embodied as a computer program product/software or in the TCP/IP stack). The state machine **430** is not described in sufficient detail in the

Applicant's specification to lead to the conclusion that it may only be implemented in

hardware, therefore the preamble of the claim needs to indicate that the system is not

directed to non-statutory subject matter.

      The Examiner believes the amendments to the claims made by Examiner to be minor

changes that do not change the thrust of the claims, but do avoid confusion and 35 U.S.C.

101 issues as discussed above.

      The application has been amended as follows:

<div align="center">**What is claimed is:**</div>

1.   A method of using a firewall resident on a host computer to prevent spoofing of an

address resolution cache of said host computer, the method comprising:

      said firewall receiving a first unsolicited message from a target computer station that

submits a genuine address resolution for a network protocol address;

      said firewall checking independently cached address resolution information

associated with said host computer;

      in response to determining that cached address resolution information for said

network protocol address of said target computer station has a previously cached address

resolution which differs from said genuine address resolution submitted by said first

unsolicited message, said firewall issuing a first broadcast request for network elements

having said network protocol address to reply with address resolution information in order

to check the authenticity of said first unsolicited message submitting said genuine address

resolution for said network protocol address;

in response to determining that no reply messages match said previously cached

address resolution that would contradict said genuine address resolution in said first

unsolicited message, said firewall determining that said first unsolicited message is not

spoofed and permitting at least one message to pass onto said host computer which includes

said genuine address resolution for said target computer station;

said firewall receiving a second unsolicited message from a spoofer that submits a

spoofed address resolution for said network protocol address of said target computer station;

said firewall checking said independently cached address resolution information

associated with said host computer;

in response to determining that said previously cached address resolution information

for said network protocol address differs from said spoofed address resolution submitted by

said second unsolicited message, said firewall issuing a second broadcast request for network

elements having said network protocol address to reply with address resolution information

in order to check the authenticity of said second unsolicited message submitting said spoofed

address resolution for said network protocol address of said target computer station;

in response to receiving a reply message from said target computer station that

matches said previously cached address resolution, said firewall determining that said second

unsolicited message is a spoofed message and blocking at least one message which includes

said spoofed address resolution from passing onto said host computer;

wherein said firewall is operable to protect said host computer from spoofed address

resolution messages while permitting genuine address resolutions.

2.   The method of claim 1, wherein said network elements reside in a LAN network

running Internet Protocol Version 4 (IPv4) using the Address Resolution Protocol (ARP) for

resolving medium access control (MAC) addresses, and said address resolution cache is an

ARP cache mapping IPv4 addresses to MAC addresses.

3.   The method of claim 1, wherein said network elements reside in a network that

implements Internet Protocol Version 6 (IPv6) with Neighbor Discovery for resolving MAC

addresses, and said address resolution cache is a Neighbor Discovery cache for mapping IPv6

addresses to MAC addresses.

4.   The method of claim 1, wherein said firewall maintains a shadow copy of said address

resolution cache, wherein said shadow copy is used as the source of said cached address

resolution information.

5-8.   (Cancelled)

10.   A firewall stored on a machine readable medium for preventing spoofing of an

address resolution cache of a host computer, said firewall comprising:

        a state machine in said firewall configured to check independently cached address

resolution information in response to receiving a first unsolicited address resolution response

message from a target computer station directed to said host computer including a submitted

genuine address resolution for a network protocol address;

        said state machine generating a request for network elements to report an address

resolution for said network protocol address in response to determining that said genuine

address resolution of said first unsolicited message differs from a previously cached address

resolution for said network protocol address in order to check the authenticity of said first

unsolicited address resolution message submitting said submitted genuine address resolution

for said network protocol address;

said state machine permitting an update of said independently cached address resolution information to include said submitted genuine address resolution in response to determining that no address resolution reply messages have said previously cached address resolution for said network protocol address that would contradict said submitted genuine address resolution of said first unsolicited message;

said state machine configured to check said independently cached address resolution information in response to receiving a second unsolicited address resolution response message from a spoofer including a submitted spoofed address resolution for said network protocol address of said target computer station;

said state machine generating a request for network elements to report an address resolution for said network protocol address in response to determining that said submitted spoofed address resolution of said second unsolicited message differs from a previously cached address resolution for said network protocol address in order to check the authenticity of said second unsolicited address resolution message submitting said submitted spoofed address resolution for said network protocol address; and

said state machine blocking an update of said independently cached address resolution information of said address resolution cache of said host computer to include said submitted spoofed address resolution for said network protocol address in response to

determining a reply message has said previously cached address resolution in contradiction to

said submitted spoofed address resolution of said second unsolicited message;

     wherein said state machine in said firewall protects said host computer from spoofed

address resolution messages while permitting genuine address resolutions.

20.   (Cancelled)

22.   (Cancelled)

     The following is an examiner's statement of reasons for allowance: the prior art does

not teach (or even suggest) allowing unsolicited address resolution information to be

accepted by a networking system. The prior art is directed to analyzing the number of

outstanding ARP requests in the network and judging whether or not a response is valid

based on whether or not a request is outstanding for such information. Applicant's invention

instead accepts unsolicited ARP responses if they are shown to contain genuine (as opposed

to spoofed) address resolution information.

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P. Whipple whose telephone number is (571)270-1244. The examiner can normally be reached on Mon-Fri (9:30 AM to 6:00 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on (571) 272-3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status information

for unpublished applications is available through Private PAIR only. For more information

about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access

to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197

(toll-free). If you would like assistance from a USPTO Customer Service Representative or

access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or

571-272-1000.

Brian P. Whipple
/B. P. W./
Examiner, Art Unit 2152
8/22/08